

**ABSTRACT OF THE INVENTION**

A wavelength detector includes an optical structure receiving an input beam, the optical structure outputting at least three wavelength dependent two-beam interference signals. Each wavelength dependent two-beam interference signal has a different phase offset. A detector receives the at least three wavelength dependent two-beam interference signals and outputs an electrical signal representative of each wavelength dependent two-beam interference. A processor receives the at least three electrical signals from the detector and generates a composite control signal. Alternatively, two of the three signals are periodic with respect to wavelength and the third signal is a reference signal. The two-beam interference signals may be created by providing patterned apertures in respective beam paths. Phase shifting interferometry techniques may be used to determine the wavelength from the periodic signals.